FCC July 21, 2003

Dear Commissioners:

I have been an amateur radio operator for 40 years, with an extra class license for ≈ 30, and a short wave listener before that. I have a BS in electrical engineering and held a first class radio-telephone license when I was chief engineer for a couple AM radio stations. I have aided radio operators on a ship on the high seas where I was an assistant motorman. I am well read. I am writing to offer some advice, if you will, on the BPL proceedings.

A good place to start is a brief quote:

> During the past decade, organizations have developed large numbers of computer-based information systems. Unfortunately, many of these systems must be classified as failures.[1]

BPL is, broadly speaking, an information system, one which would seem to hold great promise, *but so did many other information systems which ended up failures.* Many were enthusiastically supported, and some were on the cutting edge of technology. I wish to suggest that under the criterion you've placed it: with the stipulation that it not interfere with established radio services, it may not be able to work.

Why was it unworkable for the Japanese? Let's consider their approach:

> A DRIVE FOR INFORMATION.[2] Carlson, like Geneen and Matsushita, had a craving for information. He also had a sense for situations that took him into the interior of problems. ...
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> Carlson was by no means dependent on one information channel. He used his staff to prepare background studies to supplement line proposals. "We did an awful lot of prestudy before making a decision, " says one staff officer. "And we always got a number of inputs." ... "The key to an implementable decision," one controller summarized afterward, "is not only to track down the facts, but to get key the people in agreement on what those facts mean and what should be done about them. In the accounting study, everybody was on board and ready to go."[3]

It seems to me that up until this point, the FCC has been narrowly focused on a single channel, industry, which has painted a rosy picture of possibilities under existing or loosened part 15 restraints. Industry has systematically excluded users of the radio spectrum from input, where it might have been learned that part 15 restraints are regularly abused and even when followed to the letter sometimes do not protect from interference. That BPL

[1]Henry C. Lucas Jr., *associate professor, Graduate School of Business Administration, New York University*, Why Information Systems Fail (New York: Columbia University Press, 1975) Preface

[2]Richard Tanner Pascale, *Graduate School of Business, Stanford University* and Anthony G. Athos, *Graduate School of Business Administration, Harvard University*, The Art of Japanese Management *Applications for American Executives* (New York: Warner Books, 1981) pp. 260-2.

[3]Interviews with senior UAL executives.

represents threats to the radio spectrum beyond what the occasional device might have done before, you seem to have picked up on to your credit. Nevertheless, it seems to me that you have decided to go ahead full bore with BPL before considering input from radio spectrum users. A formula for disaster.

One of the factors the Japanese consider is:

> 5. *The company's relation to society and the state*[4]
>
> Here the values, expectations, and legal requirements of the surrounding larger community are explicitly honored.

Our "values, expectations, and legal requirements" are not "progress (whatever that means) at all costs." No. The mandate you do have to see to the development of new technologies is tempered by the requirement to protect other users, *especially of our scant resource of limited rf spectrum.* In fact, it is a fallacy to consider BPL *ipso facto* a new technology because it is regressive both with respect to *balanced* transmission lines and shielded coaxial cable. Here I am talking about failure to be able to give adequate protection, which is what the Japanese considered, rather than failure to work in a vacuum.

If you absolutely have to proceed with BPL (which I personally think is a poor idea), I am offering some following advice on how to mitigate the damage done and trouble you wind up in. At the very least, I believe you should hold to your own historical precedents.

First of all there are many legitimate uses of amateur radio which society (and radio law) values, including emergency communications. When other means are down, amateur radio can still function over long distances. It is too facile to say that BPL will offer alternative emergency communications, because anything that can disrupt its infrastructure, including power lines being down, will put it out of commission, and if BPL has by its overwhelming interference discouraged the deployment of amateur radio stations, a true alternative communications avenue has been lost. Historically amateur radio has been seen to work in emergencies.

Therefore all of the amateur radio allocations need to be protected. That means, first of all, no BPL use of amateur frequencies. Secondly, since the power lines being used can have nonlinear junctions generating harmonics, BPL should not be given any subharmonics of amateur frequencies either. And since those nonlinear junctions can cause a mixing of signals that spread out in frequency, we need wide guard bands also *and hardware at the junctions that have bandstops for amateur frequendies, not just high pass filters*.

[4]Pascale & Athos, p. 290.

When amateurs requested an allocation at LF, that request was denied because the power companies who used those LF frequencies for control circuits did not want to have to deal with RFI problems. To be consistent, BPL should not be allowed anywhere near HF amateur frequencies for the same reason.

Since there is overwhelming possibility for interference to existing services, I suggest going back to a historical precedent in the days when our technologies made it difficult to prevent interference between the services: quiet hours.

> Earlier that year [1923] Professor Jansky had been appointed a member of the Hoover Commission. The commission was studying the issue of mandatory quiet hours, or hours when amateurs would not transmit. The interference with broadcast listeners was at an all time high due to the many amateurs that had disregarded the ARRL suggestion of voluntary quiet hours. Late that year the Hoover Commission voted to implement the mandatory quiet hours of 8 PM to 10:30 PM local time. ...
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> In early 1925 mandatory quiet hours of 8 PM to 10:30 PM were imposed for most amateur stations by the Hoover Commission. This was the prime time for broadcast radio audiences and seemed to be the best compromise between their interests and the radio amateurs. Although Don was exempt to the regulation with his experimental license, 9XAX, he still abided by the rules. Besides, the majority of his operation was between midnight and dawn when most broadcast listeners were asleep.[5]

I suggest imposing mandatory quiet hours on BPL for every evening 6 PM to 11 PM, and all day either Saturday or Sunday. If the interference caused by BPL does not develop into a serious problem, the quiet hours can later be relaxed, but if it is worse than or as bad as feared, then they could be restricted to using even fewer hours. That would give them an incentive to keep their operation clean which they do not have right now.

Next, let's return to theory on why information systems fail:

> It is virtually impossible to develop an information system in isolation; many groups ... are involved. ... New interpersonal relations are established as information systems are developed. ... Such systems introduce new dependencies among the subunits and between the information services department and the subunits.[6]

> **4) Why won't the FCC let us operate CW or PSK31? Narrowband modes like these seem ideal for the new channels.**
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> True as that may be, the FCC followed the NTIA's lead in permitting only upper-sideband (USB) voice. In fact, 60 meters is the first generally available ham radio allocation that does not permit CW and the first below 20 meters where (LSB) is not the convention! The use of a common mode lets federal government users readily identify amateur stations as necessary.[7]

The *primary* users of 60 meters (federal government) want to be able to identify the new secondary users (amateurs), so the

[5]Jan David Perkins, Don C. Wallace, W6AM, Amateur Radio's Pioneer (Vestal, NY: Vestal Press, 1991) p47,60

[6]Lucas, p. 4.

[7]Rick Lindquist, N1RL, and Ed Hare, W1RFI, "60 Meters: Frequently Asked Questions," *QST*, August, 2003, p45

amateurs must transmit using only the mode the primary users use even though other amateur modes would be more useful and/or conventional.

The primary users of 2 MHz to 80 MHz (proposed BPL range) have no way to decipher the computer bits transmitted by BPL (nor would we want them to because of privacy concerns), so I propose that BPL users be identified every ten minutes by having the carriers and information sent be switched of and on in a simulated international morse code sequence, say between 5 and 15 wpm, identifying the user by a serial number.

> **What should I do if someone comes on the air and tells me to leave the frequency?**
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> The short answer: Stop transmitting! Assume the request is legitimate, vacate the channel promptly and ask questions later (off the air). Such government stations conceivably could include, for example, a US Coast Guard vessel running low power into a small antenna. While it's unlikely that federal government stations would ever ask amateurs over the air to vacate a channel, it's better to play it safe, since it's their band, and we're secondary users.[8]

BPL could conceivably be interfering with any number of low power operations and has the potential to interfere with high power operation. It may not be practical to ask them "over the air" to vacate one of their sub-bands, so any BPL provider should have a 1-800 number one can call to enter the serial number copied of the offending user on the touch tone pad, and have it automatically shut down the particular user's sub-band causing the interference. Since the user's BPL device is already broadcasting a serial number using international morse code as suggested above, it would be a simple matter to broadcast a suffix on each sub-band to be entered into the system to shut the interfering ones down. In fact, the sub-band suffix designators can be changed daily so that nobody can abuse the system; they would actually have to hear it to know what it is and could not otherwise call with enough information to turn a sub-band off. It should also be possible to broadcast the 1-800 number by the same means.

Access BPL should not be allowed to use power lines traversing private property by right of eminent domain where it was not considered in the proceedings.

Sincerely Yours,
Earl S. Gosnell III

[8] ibid., p. 46.